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Studies in the Botany of the Southeastern United States.—XII.

By John K. Small.

(Plate 315.)

I. Noteworthy Species.

Tradescantia montana Shuttl.; Britton, in Britton & Brown, Ill. Fl. 1: 377. *fig.* 911. 1896.

Mr. C. D. Beadle has distributed specimens of this Alleghenian *Tradescantia* from the Biltmore Herbarium, which match the original specimens of Rugel more closely than any others that I have seen. The plants from Biltmore are somewhat larger and more advanced than the specimens on which the species was founded but come from the same general region. The original specimens are accompanied by the following record: "In pre-eruptis reg. med. mont. Broad River Ms., Carolina Sept. legit Rugel, Jun. 1841.

Sisyrinchium graminoides Bicknell, Bull. Torr. Club, 23: 133. 1896.

After describing this *Sisyrinchium* Mr. Bicknell gives a general distribution for the species, but notes the "exact distribution not well made out." I can now record two definite southern stations: the first, Stone Mountain, Georgia, where I collected the plant at an altitude of about 550 meters, in 1895, and Auburn, Alabama, where Prof. Underwood gathered specimens in 1896.

Oxalis grandis Small, Bull. Torr. Club, 21: 474. 1894.

Mr. C. D. Beadle has lately sent me specimens of this, our

most robust species of *Oxalis*, from the Biltmore herbarium, collected in thickets at Biltmore, North Carolina. This collection extends the geographic range of the species somewhat further southward than was heretofore known.

OXALIS RECURVA Ell. Bot. S. C. & Ga. 1: 526. 1821.

As the exploration of the Southern States progresses, Elliott's beautiful and delicate recurved-styled *Oxalis* is being found at various points. Mr. Beadle has sent me ample specimens, showing the extensive rootstock system, and the first specimens gathered bearing mature fruit. The species grows in woodlands at Biltmore.

HEDERA HELIX L. Sp. Pl. 202. 1753.

The common European ivy must be admitted to the flora of the Southern States as an introduced species. It is frequent about old dwellings and similar places and I have found it perfectly naturalized on the steep, rocky banks of the Ocmulgee River, above Macon, Georgia, where it has escaped from a cemetery higher up on the hill.

LIMONIUM AUGUSTATUM (A. Gray).

Statice Brasiliense var. *augustata* A. Gray, Syn. Fl. 2: part 1, 54. 1878.

Perennial, slender, acaulescent; leaves basal, few, the blades linear, 4–7 cm. long, cuspidate, 1-nerved, narrowed into petioles which are somewhat shorter than the blades, their bases dilated; scapes erect, about 3 dm. tall, with several scale-like clasping bracts, sparingly branched above; bracts subtending the flowers broadly oblong, 4 mm. long, acute; calyx about 5 mm. long, the tube glabrous, the 5 teeth ovate, the connecting membranes eroded.

In salt marshes, Pine Key, Florida.

The best treatment of our North American *Limonia* that has thus far appeared is that by Dr. Gray in his Synoptical Flora, 2: Part 1, 54; but one distinct species was there admitted as a variety and one was overlooked. (See page 491.)

The plant just described is apparently rare and I call attention to it hoping that some of the botanists of southern Florida may be able to find it and collect specimens. Heretofore it has been made a variety of *Limonium Brasiliense* (Boiss.) (*Statice Brasiliensis*

Boiss.), but is readily distinguished by its more slender habit, the linear leaf-blades, the oblong acute bracts which subtend the flowers, and the ovate calyx-segments.

GENTIANA QUINQUEFOLIA L. Sp. Pl. 230. 1753.

Mr. A. M. Huger has sent me specimens of this gentian from the vicinity of Waynesville, North Carolina, noting that the plants often produce a prodigious number of flowers, he having counted over three hundred and sixty on some specimens. He has also observed the extensive altitudinal range of the species, recording that it grows from the "bottoms" to "balds," in this case from about 300 meters to nearly 1500 meters. I have noticed the same occurrence in northern Georgia.

IPOMOEA BARBIGERA Sweet, Brit. Fl. Gard. *pl. 86.* 1818.

Dr. Mohr has lately published an interesting note on this species in this journal;* the plant has apparently not been collected many times since its discovery and it would be desirable to know more of its geographic range. Prof. Carl F. Baker has sent me specimens collected near Auburn, Alabama, in the fall of 1896.

IPOMOEA PURPUREA (L.) Roth, Bot. Abh. 27. 1787.

Prof. Baker has also sent me this morning glory, collected near Auburn, Alabama, thus giving us a station between the Atlantic States and Texas; this break in its range is indicated in the Synoptical Flora.†

MENTHA ROTUNDIFOLIA (L.) Huds. Fl. Angl. 221. 1762.

Only one station in the Southern States, namely, "near Wilmington, North Carolina,"‡ has been recorded for this mint. However the species is spreading; in 1891 Miss K. A. Taylor collected specimens in a wet meadow near Columbia, South Carolina, and in 1895 I found it abundant near Trader's Hill in southeastern Georgia.

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* Bull. Torr. Club, 24: 26.

† Syn. Fl. N. A. 2: 210.

‡ Chapm. Fl. S. St. Ed. 2. 313.

TEUCRIUM NASHII Kearney, Bull. Torr. Club, 21: 483. 1894.

Mr. A. H. Curtiss has added another station for *Teucrium Nashii*. The specimens are from near Jacksonville, Florida, and are numbered 5040.

LONICERA JAPONICA Thunb. Fl. Jap. 89. 1784.

In a former note * I have spoken of the abundance of this foreign plant in certain localities. Mr. A. H. Curtiss now sends it from Florida (number 4690) saying, "In moist thickets where this gets a foothold it grows and fruits more freely than does *L. sempervirens* on dry land. I do not know that either grow from seed." I may add that it has become a very troublesome weed in many parts of the country.

II. NEW SPECIES.

VICIA HUGERI.

Annual, very slender, bright green, minutely and sparsely pubescent, or glabrate in age. Stems ascending, decumbent or reclining, solitary or several together, 3–7 dm. long, wire-like, more or less angled, sometimes branched above, rarely branched below; leaves 4–8 cm. long, the tendril simple or forked; leaflets usually 10–12, linear, 2–3.5 cm. long, mucronulate, straight or slightly curved, short-petioled; peduncles 5–8 cm. long, ascending; flowers white or sometimes pinkish, 10–14 in secund racemes, small; pedicels 1.5–2 mm. long; calyx campanulate, 1.5 mm. long, the teeth triangular, ¼–⅓ as long as the tube, acute; corolla about 5 mm. long; pods linear-oblong, 2 cm. long.

In open woods, Georgia and Alabama. March to May.

Lately several specimens of this peculiar species of *Vicia* have reached me from different points in the Southern States. The plant first came to my notice on the slopes of Stone Mountain, Georgia, in 1895. The species stands between *Vicia Caroliniana* and *V. micrantha*, possessing the general habit of the latter and the inflorescence of the former.

From *Vicia micantha* it differs in its elongated many-flowered racemes, longer peduncles and glabrous or glabrate calyx with the segments as broad as long or broader, while from *Vicia Caroliniana* it can easily be distinguished by its more slender habit,

* Bull. Torr. Club.

narrower leaves and the smaller flowers, these being hardly one-half as large as those of *Vicia Caroliniana*. I take pleasure in naming the species for my friend Mr. A. M. Huger, a very thorough explorer of the flora of the Southern States. I have specimens before me as follows:

Georgia: Stone Mountain, May 1–18, 1895, J. K. Small; Americus, March 1, 1897; Atlanta, April, 1897, and Gainesville, April, 1897, A. M. Huger.

Alabama: Auburn, March 28 and April 18, 1896, L. M. Underwood and F. S. Earle.

Samolus cuneatus.

Perennial, fleshy. Stems solitary or tufted, 1–3 dm. long, ascending or reclining, simple or usually branched; leaves opposite or mainly so, obdeltoid-spatulate or broadly spatulate, 4–12 cm. long, truncate or coarsely mucronate at the apex, the bases decurrent as broad wings; racemes 1–3 dm. long, their peduncles longer than the stems, together with the racemes glandular-pilose; pedicels slender, spreading or ascending, 1–3 cm. long; calyx campanulate, the triangular acute segments longer than the tube, or at maturity shorter; corolla white, 4–5 mm. broad, the 5 lobes broadly cuneate, flattish or truncate at the apex, toothed, as long as the tube; stamens included; capsules depressed-globose, 3–3.5 mm. in diameter; seeds .4 mm. thick.

On limestone rocks or soil, Texas. Spring.

A study of the genus *Samolus* has revealed this hitherto undescribed species; it is related to *Samolus alyssoides* and *S. ebracteatus*, from both of which it may be distinguished by the glandular-pilose peduncles and smaller corollas. The corollas of specimens of *Samolus alyssoides* and *S. ebracteatus* which I have examined vary from 6–9 mm. in breadth, while those of *S. cuneatus* are only 4–5 mm. broad. The corolla-segments of the new species are broadly cuneate as contrasted with the suborbicular segments of the two older ones.

The following specimens belong to *S. cuneatus:*

Texas: Kerrville, Kerr county, May 14–21, 1894, A. A. Heller, no. 1751 (type); Waco, 1887, Miss Sara Trimble.

Limonium Nashii.

Perennial by branching rootstocks, glabrous. Leaves basal, the blades oblong or elliptic, sometimes varying to narrowly

obovate, 4–10 cm. long, rounded or notched at the apex, occasionally mucronate, narrowed into petioles which are shorter than the blades or longer; scapes erect, 3–7 dm. tall, furnished with scale-like bracts, widely branching above, the tips of the spreading branches recurved; bracts subtending the flowers oval, about 4 mm. long, obtuse; calyx 6–7 mm. long, the tube sparingly pubescent with soft hairs at the base only, the 5 segments triangular, slightly acuminate, more than 1 mm. long; corolla deep blue.

In salt marshes, Florida. Summer and fall.

Specimens of a beautiful and previously undescribed species of *Limonium* have been in our herbaria for some years; they are from northern and eastern Florida and represent a species of more slender and more graceful habit than that of *Limonium Carolinianum*.

The following synopsis and comparison of the diagnostic characters of *Limonium Nashii* and *L. Carolinianum* will serve to make clear the difference between the two species:

Limonium Nashii. Branches of the panicle spreading, the tips recurved; bracts subtending the flowers oval; calyx-tube sparingly pubescent at the base; calyx-segments triangular, slightly acuminate.

Limonium Carolinianum. Branches of the panicle ascending, the tips curved upward; bracts subtending the flowers suborbicular; calyx-tube bristly-pubescent; calyx-segments ovate.

The species has been collected as follows:

Florida: Chapman; St. Marks, Aug. 1843, Rugel; Titusville, Brevard County, July 31, 1895, Nash. no. 2305.

EUPATORIUM PETALODIUM Britton.

Perennial, bright green. Stems erect, 3–7 dm. tall, simple below, corymbosely branched above, somewhat rough with rigid hairs; leaves mainly opposite (a few of the upper ones alternate), oblong to lanceolate, 2–8 cm. long, obtuse or rarely acutish, bluntly serrate or crenate-serrate, except the entire more or less cuneate base, glabrous or sparingly pubescent on the nerves beneath, sessile; peduncles and pedicels pilose; involucres trumpet-shaped, 9–10 mm. high, the bracts linear-spatulate, the outer ones abruptly acuminate, the inner ones mucronate, slightly surpassing the flowers, petal-like, white; corolla 3 mm. long, the segments ovate, spreading; pappus about equalling the corolla; styles exserted; achenes black, nearly 3 mm. long, 5-angled.

In dry pine barrens, Florida. Summer and fall.

Florida: Chapman; Duval County, N. E. Florida, Curtiss, no. 1190; near Jacksonville, Curtiss, nos. 4437 and 5162.

A showy species hitherto confused with *Eupatorium album* and not yet found without the State of Florida. The general habit of the species is that of its nearest relative, *E. album*, but in place of an acute leaf-blade there is an obtuse apex. However, the crucial character lies in the inner involucral bracts; these, instead of being long-acuminate, are linear-spatulate and conspicuously mucronate, the dilated portions of a white or creamy-white color.

Chrysopsis Ruthii.

Perennial, slender, silvery-pubescent, stoloniferous. Stems diffusely branched, 1–3 dm. long, the branches ascending or decumbent, very leafy, densely so above; leaves linear or some linear-lanceolate, 2–5 cm. long, acuminate, entire, sessile, the old ones becoming longitudinally ribbed; heads solitary, or corymbosely disposed, about 1 cm high; peduncles 1.5–2 cm. long, densely glandular; involucral bracts linear or linear-lanceolate, in 4–5 series, glandular on the back, the pale edges ciliate, the apex bearded; rays bright yellow, elliptic-spatulate, 7–8 mm. long, slightly notched at the apex; corolla 5 mm. long, yellow, the segments triangular, sparingly ciliate, nearly erect; pappus dirty white, slightly shorter than the corolla; filaments and anthers glabrous; style glabrous, except the very sparingly glandular top; achenes pubescent.

Rocks in the Hiawassee Valley, eastern Tennessee.

A low stoloniferous species related to *Chrysopsis graminifolia* from which it differs conspicuously in being low, diffusely branched and bushy. Besides the very slender habit, the small acuminate leaves, the glandular peduncles and narrower and more acuminate involucral bracts distinguish *Chrysopsis Ruthii* from *C. graminifolia*. The species is named for Prof. A. Ruth, of Knoxville, Tenn.

Silphium Mohrii.

Perennial, coarse, very hispid throughout with shaggy hairs. Stem erect, 6–12 dm. tall, simple below, branched above, finely channelled in age; leaves alternate, ovate-lanceolate to narrowly ovate, 5–14 cm. long, acuminate, remotely serrate with prominent teeth, except near the base and apex, sessile or nearly so; heads 3.5–4.5 cm. broad, peduncled; involucres broadly campanulate, the bracts lanceolate or ovate-lanceolate, 8–14 mm. long, acute or somewhat acuminate; corolla about 4 mm. long, the

segments ovate, rather obtuse; rays yellow, elliptic-oblong, 10–14 mm. long, undulately 3-toothed at the apex; achenes obovate, more or less constricted at both ends, about 6 mm. long, winged (Plate 315).

In dry or rocky soil, Cullman, Alabama, October, 1885.

A very distinct species of the confused genus *Silphium*, related to what I take to be *S. asperrimum* Hook., hitherto usually called *S. scaberrimum*. It is at once distinguished by the copious shaggy pubescence of its foliage as against the short retrorse pubescence of its relative. The peculiarly toothed leaves with their less rounded bases, and the smaller heads with their narrower bracts and shorter rays are additional distinguishing characters.

The species is named in honor of the veteran botanist of Alabama, Dr. Charles Mohr, who for many years has furnished our collections with rare and unique plants from that interesting region.

III. The True Position of Viola tripartita Ell.

The record of the occurrence of *Viola hastata* in Florida has always been a puzzle to me, for that plant is as typical an Alleghenian species as our flora affords.

During my field work in the Southern States I have had opportunity to study the forms under consideration in their native habitats and have been led to the following conclusions, namely: That *V. tripartita* is specifically distinct from its relatives, and that it is closely related to *V. pubescens* and *V. scabriuscula* and not to *V. hastata*. It seems strange that Dr. Gray, and even the sagacious Le Conte failed to observe the latter fact, for a casual glance at the foliage and flowers is sufficient to prove this position correct, the sepals and petals of *V. tripartita* being much more similar to those of *V. pubescens* than to those of *V. hastata*.

The question that naturally arises is: How was *V. tripartita* ever confounded with *V. hastata*? As far as I can see this was brought about through observations on simple-leaved plants of *V. tripartita*; it is on simple-leaved specimens of this plant that *V. hastata* is admitted to the flora of Florida. The leaf form of the latter species is so distinct and unique that it need not be further considered in this connection. On the other hand the leaf form of *V. tripartita* in its simple state, which is quite frequent,

closely resembles that of *V. pubescens* but differs in size, shape, proportionate width and length and the toothing. It may be of interest to note that I have seen the type of *V. tripartita* on several occasions and have collected specimens almost identical with it on Stone Mountain, which is no great distance from the original locality, Athens, Georgia. I have also received excellent and typical specimens from Mr. A. M. Huger, collected in Polk County, North Carolina, and a series of specimens showing all degrees of gradation from the simple-leaved state to the trifoliolate leaf, from Mr. E. R. Memminger, who independently came to the conclusion that the affinities of *V. tripartita* are with *V. pubescens* and not with *V. hastata.*

I append a description taken from living plants.

VIOLA TRIPARTITA Ell. Bot. S. C. & Ga. 1: 320. 1817.

Viola hastata var. *tripartita* A. Gray, Bot. Gaz. 11: 291. 1886.

Perennial by a short rootstock and numerous coarse roots, usually stoutish, puberulent or minutely pilose and glandular above, bright but often deep green. Stems mostly clustered, erect, 1.5–5 dm. tall, usually branched above, often purplish and glabrate below, greenish, glandular, and somewhat glandular near the top; leaves 3-parted or sometimes entire, 4–10 cm. long, their petioles 2–3 cm. long; stipules ovate, ciliate, 6–8 mm. long; leaflets usually short-petioled, puberulent, undulate or crenate-serrate, the terminal one lanceolate or oblanceolate, the lateral ones inequilateral lanceolate to ovate; flowers golden yellow, 1.2–1.5 cm. broad; pedicels slender, nearly erect, 3–10 cm. long; sepals lanceolate or oblong-lanceolate, nearly 6 mm. long, 3-ribbed, acute or obtuse, with hyaline ciliolate margins; petals spatulate, about 1 cm. long, the upper ones recurved, purplish on the back, with one conspicuous black vein, the lateral ones with two black veins and a patch of glands, the lower one with numerous conspicuous black veins; stigma bearded; capsule oblong, 1–1.2 cm. long, acutish; seeds pale, obovoid, 3 mm. long.

IV. MELOTHRIA GRANDIFOLIA T. & G., AND ITS TRUE POSITION.

Melothria grandifolia, published by Torrey and Gray in 1840, soon disappeared from the pages of succeeding botanical works and in Prof. Cogniaux's Monograph of the Cucurbitaceae* we find the name in an appended list of doubtful species. The apparent rarity of the species, or at least the scarcity of speci-

*DC. Monog. Phanerog. 3: 948.

mens in herbaria may account for the way in which the plant was excluded from botanical literature by later authors; an examination of the original specimens of the plant in question, however, shows that it is not a *Melothria* in the modern sense and hereafter may be known as

CAYAPONIA GRANDIFOLIA (T. & G.).

Melothria grandifolia T. & G. Fl. N. A. 1: 541. 1840.

The species is closely related to *Cayaponia Boykinii* of the Southern States, but differs in the more robust habit, the larger leaves and in the larger and more elongated fruit.

The Santa Monica Diatomaceous Deposit with List of References to Figures of Species.

BY E. A. SCHULTZE AND C. HENRY KAIN.

Probably no fossil diatomaceous material ever excited greater interest than that from Santa Monica, California. A paper upon the deposit by Mr. Charles Stodder was read before the San Francisco Microscopical Society, December 5, 1878. At that meeting, Mr. Thomas P. Woodward, who found the original piece of material, stated that he discovered it in the tidal refuse left by the waves at high water mark. The locality was about two miles south of a lagoon situated several miles southeast of Santa Monica. He also stated that there were no evidences of any other diatomaceous earth in the vicinity.

A few years since, Mr. F. H. Dunning, of Battle Creek, Michigan, discovered that the true source of the material was at Redonda Beach, some twenty-five or thirty miles south of Santa Monica. At this place the material occurs abundantly in a bluff situated on the beach, and pieces of it which have been broken off by the action of the waves can be picked up at low tide, at the foot of the cliff.

Mr. Silas L. Schumo, of Philadelphia, who has recently visited the locality, states that the diatom cliffs begin about ten miles south of Redondo Beach and extend southward for several miles, at least as far as San Pedro. There is some difficulty in getting at the material, however, as the foot of the cliff is only accessible at low tide. The deposit is so interesting that it is to be hoped microscopists on the Pacific coast will explore it more thoroughly.

SILPHIUM MOHRII SMALL.